

WHAT IS CLAIMED IS:

1. A digital imaging system comprising:
an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit; and
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable of
detecting color and illuminance of the acquired digital images based on color and
illuminance of multiple images from actual image data stored in a color image
database.
2. A digital imaging system according to Claim 1 further comprising:
the processor executes an illuminant detection training algorithm that bases control of
illumination and color on a database storing actual illuminants, scenes, and
subjects from representative image acquisition devices such as digital cameras
and scanners.
3. A digital imaging system according to Claim 1 further comprising:
a correlation matrix contained within the correlation matrix memory, the correlation
matrix being a two-dimensional matrix comprising a first dimension
corresponding to a set of candidate illuminants and a second dimension
corresponding to chromaticities, the illuminants and the chromaticities being
selected based on data in the database storing actual illuminants, scenes, and
subjects from representative image acquisition devices such as digital cameras
and scanners.
4. A digital imaging system according to Claim 1 further comprising:
an image vector process operational in the image processing process and capable of
forming an image vector based on chromaticities associated with the acquired
image; and
a chromaticity assignment process of the image vector process that is capable of
assigning positions of the image vector according to chromaticity, further
comprising:

a data conversion process that converts RGB data from the acquired image to chromaticities selected based on color and illuminance of multiple images stored in the color image database;

a position selection process that sets a position of the image vector to a first binary value if chromaticity corresponding to the position appears in the acquired image; and

a position deselection process that resets a position of the image vector to a second binary value if chromaticity corresponding to the position fails to appear in the acquired image.

5. A digital imaging system according to Claim 4 further comprising:

a matrix multiplication process operational in the image processing process and capable of multiplying the image vector by the correlation matrix to form a resulting vector; and

an illuminant selection process operational in the image processing process and capable of selecting at least one candidate illuminant from the set of candidate illuminants to be the associated illuminant in the acquired digital image based on the resulting vector, the set of candidate illuminants being selected based on color and illuminance of multiple images stored in the color image database.

6. A digital imaging system according to Claim 1 further comprising:

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined for a variety of illuminants, scenes, and subjects that are expected to be of interest to users of a particular camera or group of cameras.

7. A digital imaging system according to Claim 1 further comprising:

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on actual image data including tags that identify the image

acquisition device that acquires a particular image, and information concerning manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition.

8. A digital imaging system according to Claim 1 further comprising:
a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning the manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition.
9. A digital imaging system according to Claim 1 further comprising:
a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to tags such as manufacturer and model tags to screen the digital images stored in the database according to manufacturer and model.
10. A digital imaging system according to Claim 1 further comprising:
a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to private image tag information including manufacturer and model information tags, and image data tags including focal length, shutter speed, and aperture.

PCT/US2010/035000

11. A method of operating a digital imaging system comprising:
acquiring digital images;
forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and
detecting a color and illuminance of the acquired digital images based on color and illuminance of multiple images from actual image data stored in a color image database.
12. A method according to Claim 11 further comprising:
communicating acquired digital image data and illuminant and chromaticity data between an image acquisition device and the color image database.
13. A method according to Claim 11 further comprising:
basing control of illumination and color on a database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.
14. A method according to Claim 11 further comprising:
forming an image vector based on chromaticities associated with the acquired image;
assigning positions of the image vector according to chromaticity, further comprising:
converting RGB data from the acquired image to chromaticities selected based on color and illuminance of multiple images stored in the color image database;
selecting a position of the image vector to a first binary value if chromaticity corresponding to the position appears in the acquired image; and
deselecting a position of the image vector to a second binary value if chromaticity corresponding to the position fails to appear in the acquired image.
15. A method according to Claim 14 further comprising:
selecting at least one candidate illuminant from the set of candidate illuminants to be the associated illuminant in the acquired digital image based on the resulting vector,

selecting the set of candidate illuminants based on color and illuminance of multiple images stored in the color image database.

16. A method according to Claim 11 further comprising:
determining the illuminants and chromaticities for a variety of illuminants, scenes, and subjects that are expected to be of interest to users of a particular camera or group of cameras.
17. A method according to Claim 11 further comprising:
determining the illuminants and chromaticities based on actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition.
18. A method according to Claim 11 further comprising:
determining the illuminants and chromaticities based on information relating to actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning the manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition comprising focal length, shutter speed, and aperture.
19. A digital imaging system comprising:
means for acquiring digital images;
means for forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and
means for detecting a color and illuminance of the acquired digital images based on color and illuminance of multiple images stored in a color image database.
20. A digital imaging system according to Claim 19 further comprising:
means for basing control of illumination and color on a database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.